GCSE Mathematics

Practice Tests: Set 9

Paper 3F (Calculator)

Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.

- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question*.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions.

Write your answers in the stages provided.

You must write down all the stages in your working.

1   On the dotted line, write the number so that the two fractions are equivalent.

$$\frac{40}{100} = \frac{\text{.................}}{25}$$

(Total for Question 1 is 1 mark)

2   Write $\frac{6}{20}$ as a percentage.

....

(Total for Question 2 is 1 mark)

3   Write $\frac{18}{100}$ as a decimal.

....

(Total for Question 3 is 1 mark)

4   Work out $\frac{5}{9}$ of 72

....

(Total for Question 4 is 1 mark)

5 Here are the first five terms of a number sequence.

<div align="center">96   90   84   78   72</div>

(*a*) Write down the 6th term of the sequence.

....

(1)

(*b*) Explain how you found your answer to part (*a*).

....

(1)

The 15th term of the sequence is 12.

(*c*) Work out the 14th term of the sequence.

....

(1)

(**Total for Question 5 is 3 marks**)

6   The diagram shows a rhombus *ABCD*.
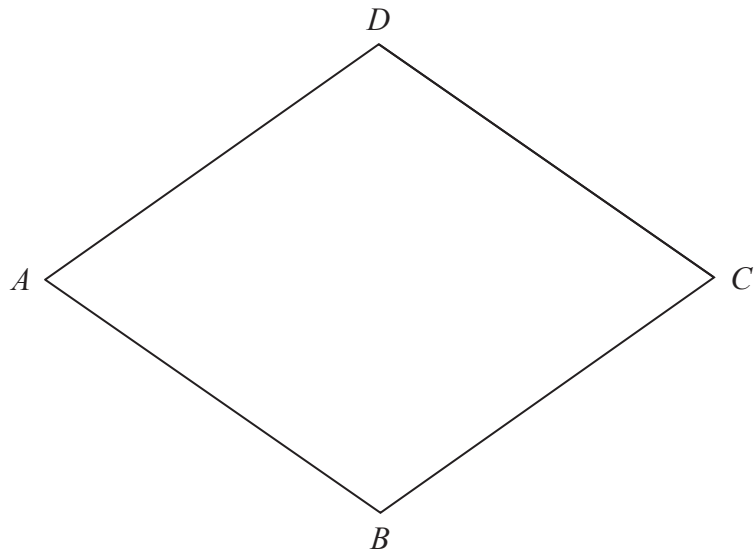
(*a*) Measure the length of *AB*.

.... cm

(1)

(*b*) Measure the size of angle *ABC*.

.... °

(1)

(Total for Question 6 is 2 marks)

7 Potatoes cost 1.20 euros per kilogram.

(*a*) Work out the cost of 5 kilograms of potatoes.

.... euros
(1)

Courgettes cost 2.55 euros per kilogram.

(*b*) Work out the cost of 0.6 kilograms of courgettes.

.... euros
(1)

Carrots cost 0.84 euros per kilogram.
Onions cost 0.92 euros per kilogram.
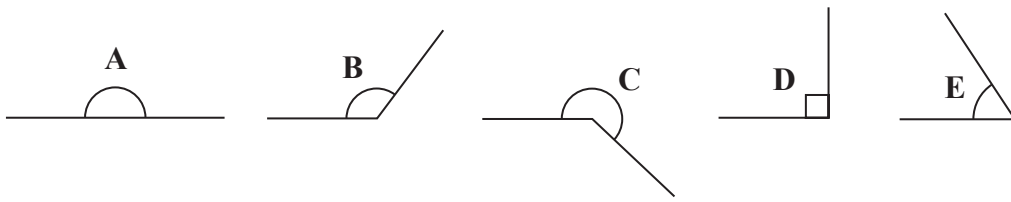
Anna buys 500 grams of carrots and 750 grams of onions.
She pays with a 5 euro note.

(*c*) Work out how much change Anna should receive.

.... euros
(3)

(**Total for Question 7 is 5 marks**)

8 Five angles are marked in the following diagram.

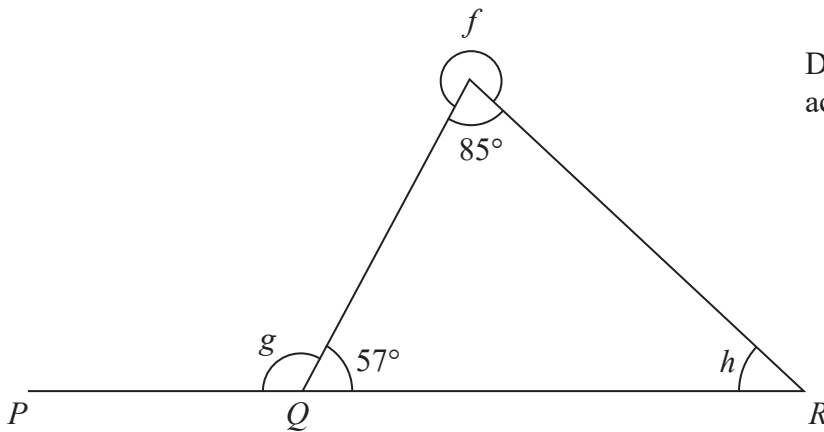(a) Write down the letter of the angle that is a reflex angle.

....
(1)

Diagram **NOT** accurately drawn

(b) Work out the size of angle f.

....°
(1)

PQR is a straight line.

(c) Work out the size of angle g.

....°
(1)

(d) Work out the size of angle h.

....°
(2)

(Total for Question 8 is 5 marks)

9 (*a*) Work out $(-9) - (-15)$

....
(1)

(*b*) Work out $6 \times (-8)$

....
(1)

(*c*) Work out $(-64) \div (-4)$

....
(1)

(**Total for Question 9 is 3 marks**)

10 (*a*) Simplify $g + 2g + 3g - 4g$

....
(1)

(*b*) Solve $6m = 18$

$m =$ ....
(1)

$P = 46 - 3st$

(*c*) Work out the value of P when $s = 2$ and $t = 5$

$P =$ ....
(2)

$Q = 4e + 3f$

(*d*) Work out the value of e when $Q = 43$ and $f = 7$

$e =$ ....
(3)

(Total for Question 10 is 7 marks)

11 The area of land on a farm is 120 hectares.

The farmer grows crops on $\frac{7}{8}$ of the land.

On $\frac{2}{3}$ of the land used to grow crops, the farmer grows wheat.

(*a*) Work out the area of the land on the farm used to grow wheat.

.... hectares

(3)

Last year, the farmer made 31 500 euros from selling his wheat.
His total income was 42 000 euros.

(*b*) Write 31 500 as a percentage of 42 000.

.... %

(2)

(Total for Question 11 is 5 marks)

12 Show that $3\dfrac{3}{8} \div 2\dfrac{1}{4} = 1\dfrac{1}{2}$

(**Total for Question 12 is 3 marks**)

13   (*a*)   Find the value of $\sqrt[3]{59.319}$

....

(1)

(*b*) Find the value of 6^4

....

(1)

(*c*) Work out the value of $\left(\dfrac{125.6}{4.7}\right)^2$

Write down all the figures on your calculator display.

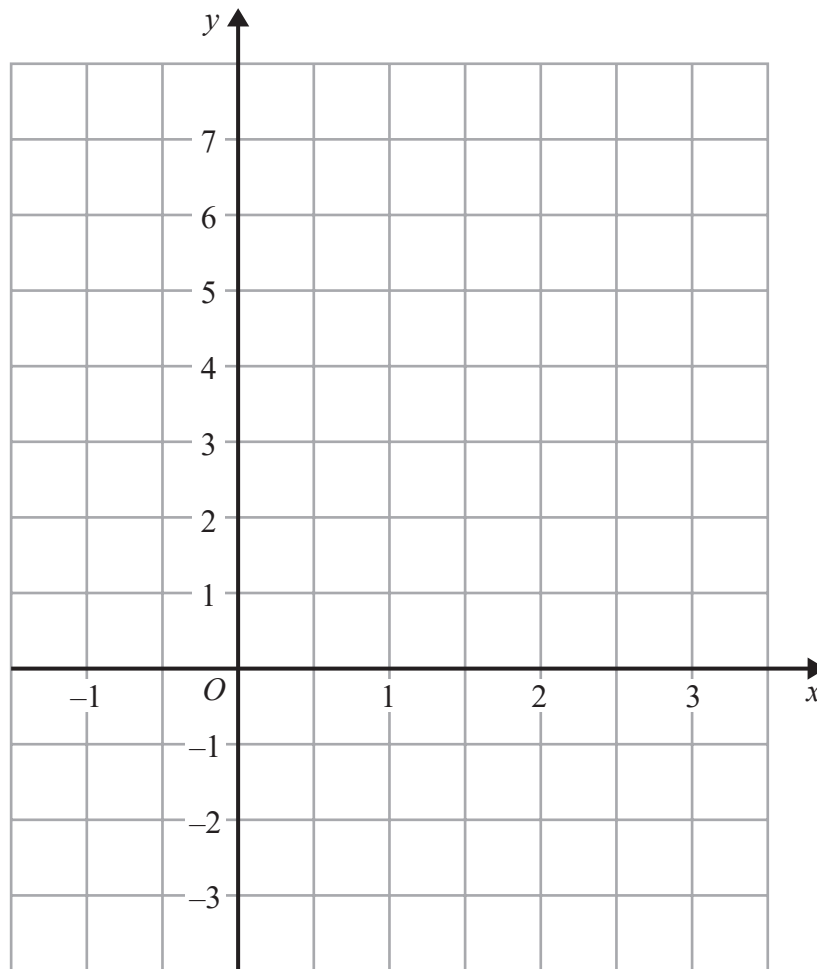...

(2)

(*d*) Write your answer to part (*c*) correct to 3 significant figures.

....

(1)

(**Total for Question 13 is 5 marks**)

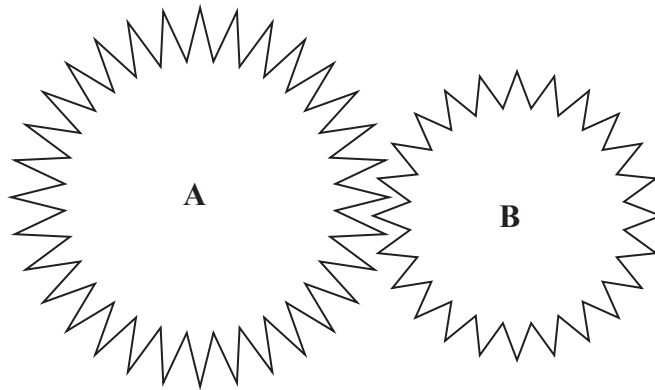**14** (*a*) On the grid, draw the graph of $y = 4 - 2x$ for values of x from -1 to 3.

(3)

(*b*) Write down the coordinates of the point where the graph of $y = 4 - 2x$ crosses the line $y = 1$

(.........................., ...)

(1)

(Total for Question 14 is 4 marks)

15 The diagram shows two cogs, **A** and **B**.

There are 32 teeth on cog **A**.
There are 24 teeth on cog **B**.

(*a*) Write down the ratio of the number of teeth on cog **A** to the number of teeth on cog **B**.
Give your ratio in its simplest form.

....
(2)

The two cogs both rotate.
Cog **A** completes 12 full turns while cog **B** completes 16 full turns.

(*b*) Work out the number of full turns that cog **A** completes while cog **B** completes
60 full turns.

....
(2)

(Total for Question 15 is 4 marks)

16   The size of each exterior angle of a regular polygon is 24°
     (*a*) Work out the number of sides of the polygon.

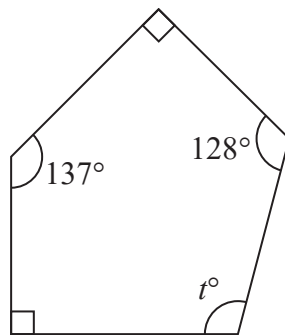   ....
     (2)

Here is a pentagon.

Diagram **NOT**
accurately drawn

     (*b*) Work out the value of *t*.

     ....
     (3)

     (**Total for Question 16 is 5 marks**)

17   Marta breeds dogs.
32 dogs give birth to puppies.
The table shows information about the number of puppies born to each dog.

Number of puppies	Frequency
1 – 3	5
4 – 6	12
7 – 9	10
10 – 12	4
13 – 15	1

(*a*) Write down the modal class.

....
(1)

(*b*) Work out an estimate for the mean number of puppies born to each dog.

....
(4)

(**Total for Question 17 is 5 marks**)

18
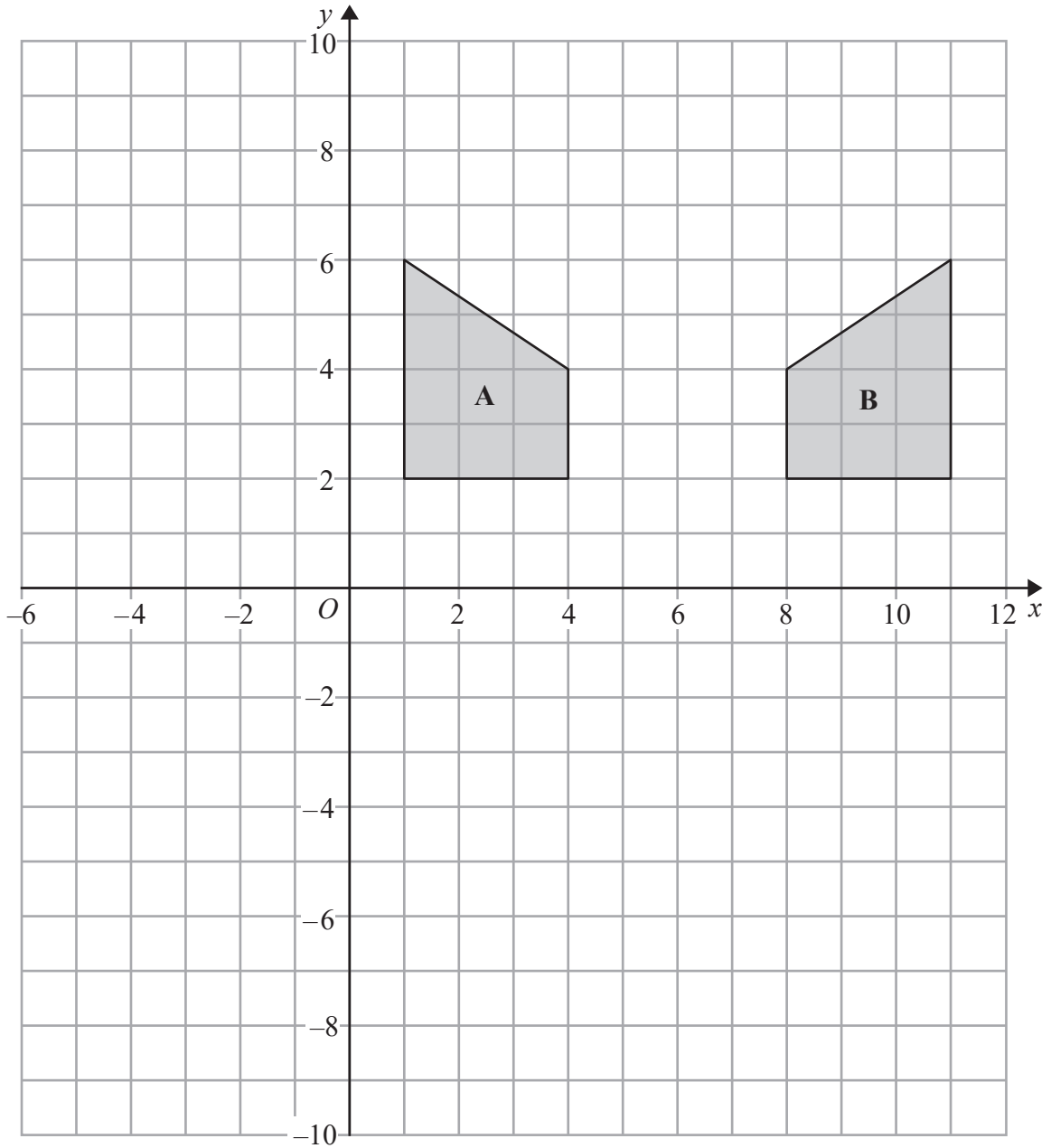
(a) Describe fully the single transformation that maps shape **A** onto shape **B**.

....

....

(2)

(b) On the grid, rotate shape **A** 180° about (4, 0)

(2)

(Total for Question 18 is 4 marks)

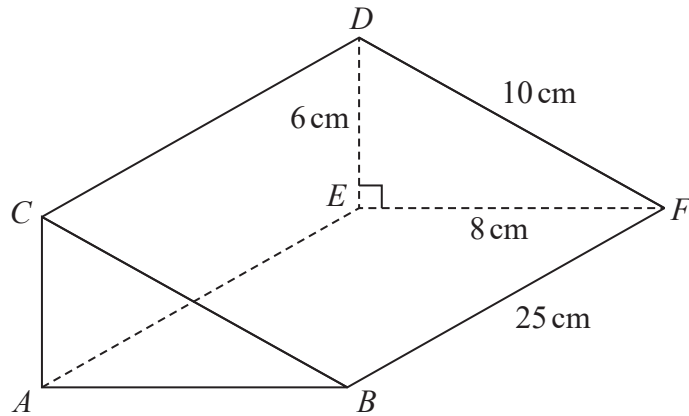**19** The diagram shows a solid triangular prism *ABCDEF*.

Diagram **NOT** accurately drawn

EF = 8 cm, *DE* = 6 cm, *DF* = 10 cm and *BF* = 25 cm.
Angle *DEF* = 90°

(*a*) Work out the area of triangle *DEF*.

.... cm²
(2)

(*b*) Work out the volume of the prism.

.... cm³
(2)

(*c*) Work out the total surface area of the prism.

.... cm²
(3)

(Total for Question 19 is 7 marks)

20 $\mathscr{E} = \{\text{fish in Jake's lake}\}$
$A = \{\text{fish of length greater than 20 cm}\}$
$B = \{\text{fish that weigh more than 1 kg}\}$
$C = \{\text{fish less than 1 year old}\}$

A fish in Jake's lake is caught.
The fish is 2 years old, weighs 1.2 kg and is 19 cm in length.

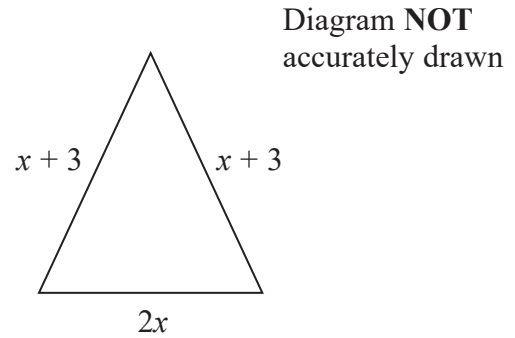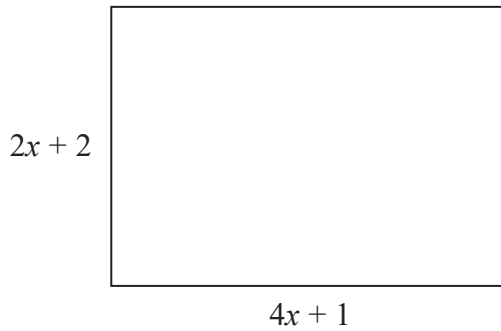(*a*) Write down the set, *A* or *B* or *C*, of which this fish is a member.

....
(1)

(*b*) Describe in words fish that are members of the set $A \cup B$

....

....
(2)

(Total for Question 20 is 3 marks)

21 The diagram shows a rectangle and an isosceles triangle.
All measurements are in centimetres.

Diagram **NOT**
accurately drawn

$2x + 2$

$4x + 1$

$x + 3$ $x + 3$

$2x$

(a) Write down an expression in terms of x for

   (i) the perimeter of the rectangle,

....cm

   (ii) the perimeter of the triangle.

....cm

(2)

The perimeter of the rectangle is equal to 2 times the perimeter of the triangle.

(b) Work out the value of x.
   Show clear algebraic working.

....

(4)

(Total for Question 21 is 6 marks)

TOTAL FOR PAPER IS 80 MARKS

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